



UNITED STATES
 NUCLEAR REGULATORY COMMISSION
 REGION II
 101 MARIETTA ST., N.W., SUITE 3100
 ATLANTA, GEORGIA 30303

Report No. 50-395/82-04

Licensee: South Carolina Electric and Gas Company
 P. O. Box 764
 Columbia, SC 29218

Facility Name: V. C. Summer

Docket No. 50-395

License No. CPPR-94

Inspection at V. C. Summer Site

Inspector: C. D. Evans 2/17/82
 C. D. Evans Date Signed

Approved by: D. M. Montgomery 2/17/82
 D. M. Montgomery, Chief, IM&EP Section, Date Signed
 EPOS Division

SUMMARY

Inspection on January 18-22, 1982

Areas Inspected

This routine, unannounced inspection involved 33 inspector-hours on site in the areas of quality control for radiochemistry and chemistry including a review of the laboratory quality control program, the radioactive effluent accountability program and capability tests for measurement of radioactive effluents.

Results

Of the three areas inspected, no violations or deviations were identified in three areas.

REPORT DETAILS

1. Persons Contacted

Licensee Employees

- *O. S. Bradham, Plant Manager
- *L. A. Blue, Health Physics Supervisor
- *J. W. Cox, Assistant Health Physics Supervisor
- *F. C. Bacon, Chemistry Supervisor
- L. F. Faltus, Assistant Chemistry Supervisor
- *J. Barker, Corporate Staff Health Physicist

NRC Resident Inspector

- *J. L. Skolds

*Attended exit interview

2. Exit Interview

The inspection scope and findings were summarized on January 22, 1982 with those persons indicated in paragraph 1 above.

3. Unresolved Items were not identified during this inspection.

4. Licensee Action on Previous Inspection Findings

(Closed) (81-26-01) Correction of air particulate monitor sampling flows for period prior to May 15, 1981 to satisfy one year preoperational monitoring requirement.

(Closed) (81-26-02) Status of environmental TLD program regarding its compliance with energy response range as per section 4.8.4 of ANSI 5.45-1975.

(Closed) (81-26-03) Recalibration of Ge(Li) detector with a properly spiked charcoal cartridge standard.

(Closed) (81-26-04) Updating of nuclide identification library with data from recent publications.

(Closed) (80-32-01) Required modification of air particulate monitors to achieve and maintain an assigned sampling flow rate of 1-CFM.

(Closed) (80-32-02) Revise Environmental Surveillance Procedures Manual to identify each procedure as a separate entity and to require documentation of calibration of sampling equipment.

(Closed) (81-25-01) Review of Quality Assurance Program for Radiological Effluent Monitoring.

(Closed) (81-25-02) Completion of Radiochemistry Procedures.

(Closed) (81-25-04) Calibration of Ge(Li) Detector for Gas Counting.

(Closed) (81-25-05) Calibration of Liquid Scintillation Counter.

(Closed) (81-25-03) Capability Test for Radioactivity in Liquids.

The inspector reviewed the licensee's corrective actions in response to the above items and had no further questions.

5. Program for Quality Control of Radioactive Effluent Measurements

Proposed Technical Specification 6.8.1.c requires that written procedures be established, implemented, and maintained for a Quality Assurance program for effluent and environmental monitoring using the guidance in Regulatory Guide 4.15, December 1977. The inspector reviewed the quality assurance program for effluent monitoring with respect to meeting the general guidance of Regulatory Guide 4.15 covering the following areas:

- a. Organizational Structure - The V. C. Summer Nuclear Station Health Physics Section organization is delineated in the Health Physics Manual dated December 12, 1981. The manual assigns authorities, duties, and responsibilities of positions within the Health Physics Section from the managerial level down to the technician level. The day-to-day responsibility for managing the quality control program for effluent monitoring is delegated to an assistant health physics supervisor.
- b. Qualifications of Personnel - The qualifications of individuals performing radiochemical analyses are specified in the Health Physics Manual. The inspector noted that all members of the Health Physics Section assigned duties in the radiochemical laboratory meet the specifications defined in the manual.
- c. Operating Procedures - The Health Physics Manual requires that written procedures be developed and implemented for all aspects of the effluent monitoring program. This includes procedures for calibration and quality control of instrumentation, sample processing, and analysis. The inspector reviewed the procedures listed in paragraph 6.
- d. Records

The inspector verified that the Health Physics count room procedures provide for documentation of activities including records of calibration, performance checks, sample collection, analysis, and reporting. Records of calibration of the Ge(Li) gamma spectroscopy system and quality control checks are required by procedures HPP-812-"Operation and Calibration of the Ge(Li) System," and HPP-813-"Quality Control of the Ge(Li) System". Records of sample collection and analysis are required by procedure, HPP-808-"Sample Analysis".

e. Quality Control in the Radioanalytical Laboratory

(1) Intra and Interlaboratory Comparison Checks

The inspector determined from review of procedure HPP-817 "Quality Control of Sampling and Sample Analysis Methods", that the licensee has established requirements for periodic analysis of replicate and spiked samples and for participation in an interlaboratory cross-check program. The inspector noted that the licensee has chosen the EPA Environmental Radioactivity Intercomparison Program and the NRC Confirmatory Measurements Program. The inspector stated the EPA program was not appropriate for a comparison because the radioactivity levels of these samples are much lower than would be expected for routine effluent releases, and that the NRC Confirmatory Measurements Program is an enforcement activity and would not fulfill requirements for a licensee cross-check program. A licensee representative stated that the utilization of SCE&G Environmental Laboratory for the purpose of a cross-check program would be investigated. This area will be reviewed during a subsequent inspection (82-04-01).

(2) Performance Checks

The inspector determined from review of procedure HPP-813-"Quality Control of the Ge(Li) Spectroscopy System", and HPP-801-"Quality Control Test of the Liquid Scintillation and Proportional Counters", that the licensee has instituted performance checks with acceptance criteria and corrective action when performance checks fall outside predetermined control values.

f. Review, Analysis, and Reporting Data

The inspector noted that the Health Physics count room procedures do not provide for review of analytical results by supervisory personnel. A licensee representative stated that procedures would be revised to provide for review by management. The revised procedure will be reviewed during subsequent inspection 82-04-02).

g. Audits of the Quality Assurance Program

- 1) The inspector noted that there are no provisions for periodic audits of the radiochemistry and chemistry programs to determine compliance with Technical Specifications and Operating Procedures. A licensee representative agreed to include these areas in the Quality Control audit program. This area will be reviewed during subsequent inspection (82-04-03).
- 2) Proposed Technical Specification 6.5.2.8.0 requires a comprehensive audit of activities required by the Quality Assurance Program to meet the criteria of Regulatory Guide 4.15, at least once per 12 months. The individuals performing the audit shall be

qualified in radiochemistry and should not have direct responsibilities in the Summer radiochemistry programs. A licensee representative indicated that provisions for the annual audit are being made with the SCE&G Environmental Laboratory. This area will be reviewed during a subsequent inspection (82-04-04).

6. Review of Radiochemistry Procedures

a. The inspector reviewed the following procedures:

HPP-802, Operation of the Beckman L.S. 7500 Liquid Scintillation Counter

HPP-810, Sampling of Radioactive Gases and Liquids, 11-8-81

HPP-808, Sample Analysis, not issued

HPP-710, Release of Radioactive Liquid Effluents, not issued

HPP-801, Quality Control Test of L.S.-7500 System, G.M. Counters and Gas Flow Proportional Counters, 1-17-81

HPP-817, Quality Control of Sampling and Sample Analysis Methods, 1-19-81

HPP-812, Operation and Calibration of the N.D.-66/H.P.-9845 Ge(Li) Spectroscopy System, 1-19-81

HPP-813, Quality Control of the Ge(Li) Spectroscopy System, 1-19-81

HPP-709, Release of Radioactive Gaseous Effluents, not issued

HPP-916, Computer Program Control, 11-17-81

HPP-917, Computer Program Testing, 11-17-81

HPP-811, Transfer of Mixed Gamma Emitting Gas Standard, 10-27-81

HPP-803, Operation of the Tennelec LB-5100 Automatic Counting System, 1-15-81

AP-600, Chemistry Operations Manual, 5-11-79

CHP-132, Boron Determination, 11-30-79

CHP-902, Chemistry Sampling Point List, 11-20-81

CHP-608, Chemistry Group Quality Control Program, 12-7-79

CHP-103, Fluoride Determination, 4-8-80

CHP-303, Determination of Dose Equivalent Iodine, 1-21-82

CHP-304, Determination of Tritium, 1-21-82

CHP-302, Determination of Average Energy per Disintegration 1-21-82

HPP-920, Post Accident Reactor Building Atmospheric Sampling, 1-7-82

The inspector discussed the results of the procedure review with licensee representatives as noted in paragraph 6b - 6g. The inspector stated that procedures that have not been approved for plant operation would be carried as an open item. A licensee representative indicated that all radiochemistry and chemistry procedures would be approved before February 28, 1982 (82-04-05).

- b. Proposed Technical Specification 3.11.2.6 requires that the quantity of radioactivity contained in each waste gas storage tank shall be limited to less than or equal to 60,000 curies noble gas (considered as Xe-133). The inspector noted that the licensee did not have an established method to convert the measured noble gases to an equivalent concentration of Xe-133. A licensee representative acknowledged the need for an established method and indicated that a computer program would be developed and documented for this purpose. The computer program and documentation will be reviewed during a subsequent inspection (82-09-06).
- c. Proposed Technical Specification 4.11.1.1.3 requires that a daily grab sample be taken of the continuous releases from the turbine building sump and service water effluent. It also requires that the daily grab samples from the effluent streams be composited weekly in proportion to the respective daily rate of flow. The inspector noted that procedure HPP-810-"Sampling of Radioactive Gases and Liquids", did not address this requirement. A licensee representative agreed to review and revise the procedure to incorporate this requirement. The revised procedure will be reviewed during a subsequent inspection (82-04-07).
- d. The inspector noted that there was no calibration program for the photohelic flow gauges on the Main Plant Vent Radiation Monitor (RM-A3) and the Containment Purge Radiation Monitor (RM-A4). The inspector stated that this did not meet the recommendation of Regulatory Guide 4.15 for scheduled recalibration of flow measuring devices used for effluent accountability. A licensee representative indicated that calibration of the flow gauge would be included in the MT&E program of the plant maintenance department. This area will be reviewed during a subsequent inspection (82-04-08).
- e. The inspector noted that the technique for calibration of the liquid scintillation counter for tritium in aqueous samples utilized a nonaqueous tritium standard which may not be representative of actual samples. The inspector also noted that sample preparation did not include distillation for decontamination from other radionuclides

present in the sample. A licensee representative agreed to revise the procedure to address the above concerns. The revised procedure will be reviewed during a subsequent inspection (82-04-09).

- f. The inspector noted that the licensee had not documented and tested the software packages for gamma spectral analysis, Ge(Li) quality control, and effluent accountability as required in procedure HPP-917, "Computer Program Testing". A licensee representative agreed to document and test all software packages. The testing would consist of entering data into the computer and comparing the results to those calculated manually using the algorithm of the software packages. The documentation and test data will be reviewed during a subsequent inspection (82-09-10).
- g. The inspector noted that the licensee had not routinely performed quality control checks on counting room instrumentation. The inspector noted that the licensee procedures require quality control checks on a daily or as used basis and that this practice should be in progress to provide adequate pre-operational testing data for the counting room instrumentation. A licensee representative agreed to institute routine quality control checks for laboratory instrumentation immediately. This area will be reviewed during a subsequent inspection (80-04-11).

7. Capability Tests

The licensee was provided with a simulated liquid waste and filter sample prepared by the DOE Radiological Environmental Services Laboratory for gamma spectroscopy, tritium, and strontium 89 and 90 analyses. These analyses serve to verify the licensee's capability to measure radionuclides in effluent samples. The results of the licensee's gamma spectroscopy and strontium 89 and 90 analyses and comparison to NRC values are presented in Table 1 with the acceptance criteria in Attachment 1. The results show "agreement" for all nuclides identified by gamma spectroscopy, but the results show "disagreement" for the strontium 89 and 90 analyses for both samples. The inspector noted that this was the licensee's first attempt at performing a strontium 89 and 90 analysis. The inspector stated that the procedure should have been tested and verified by analysis of spiked samples prior to approval as an operating procedure. A licensee representative indicated that the procedure would not be finished before issuance of an operating license and that selection of a contract laboratory was under way. The inspector noted that Regulatory Guide 4.15 also applies to contract laboratories, and this should be a criterion in selection of a contract laboratory. Another simulated waste liquid and filter sample will be sent to the licensee for analysis by the licensee's contract laboratory for strontium 89 and 90. The licensee had not completed the tritium analysis, but agreed to forward results to NRC:II when completed. This area will be reviewed during a subsequent inspection. (82-04-12).

TABLE 1
RESULTS OF CAPABILITY TESTS AT V.C. SUMMER, JANUARY 18-22, 1982

Concentration, microcuries/ml.

<u>Sample</u>	<u>Isotope</u>	<u>V.C. Summer</u>	<u>NRC</u>	<u>Ratio</u>	<u>Resolution</u>	<u>Comparison</u>
DOE	Co-57	(1.13±.08)E-3	(1.13±.08)E-4	1.00	38	Agreement
Simulated	Cs-134	(1.89±.08)E-3	(1.81±.03)E-3	1.04	60	Agreement
Liquid Waste	Co-60	(3.65±.15)E-3	(3.52±.09)E-3	1.03	39	Agreement
	Sr-89	(3.73)E-3	(8.29±.01)E-3	.44	829	Disagreement
	Sr-90	(1.22)E-4	(5.92±.04)E-4	.20	148	Disagreement

Concentration, microcuries/sample

DOE	Sr-89	3.97E-3	(8.29±.01)E-3	.47	829	Disagreement
Simulated Particulate Filter	Sr-90	N.A.R.	(5.29±.04)E-4	N.C.	148	Disagreement

N.C. - No comparison

N.A.R. - No activity reported

Attachment 1

CRITERIA FOR COMPARING ANALYTICAL MEASUREMENTS

This attachment provides criteria for comparing results of capability tests and verification measurements. The criteria are based on an empirical relationship which combines prior experience and the accuracy needs of this program.

In these criteria, the judgment limits are variable in relation to the comparison of the NRC Reference Laboratory's value to its associated uncertainty. As that ratio, referred to in this program as "Resolution", increases, the acceptability of a licensee's measurement should be more selective. Conversely, poorer agreement must be considered acceptable as the resolution decreases.

$$\text{RATIO} = \frac{\text{LICENSEE VALUE}}{\text{NRC REFERENCE VALUE}}$$

<u>Resolution</u>	<u>Agreement</u>	<u>Possible Agreement A</u>	<u>Possible Agreement B</u>
<3	0.4 - 2.5	0.3 - 3.0	No Comparison
4 - 7	0.5 - 2.0	0.4 - 2.5	0.3 - 3.0
8 - 15	0.6 - 1.66	0.5 - 2.0	0.4 - 2.5
16 - 50	0.75 - 1.33	0.6 - 1.66	0.5 - 2.0
51 - 200	0.80 - 1.25	0.75 - 1.33	0.6 - 1.66
>200	0.85 - 1.18	0.80 - 1.25	0.75 - 1.33

"A" criteria are applied to the following analyses:

Gamma Spectrometry where principal gamma energy used for identification is greater than 250 Kev.

Tritium analyses of liquid samples.

"B" criteria are applied to the following analyses:

Gamma Spectrometry where principal gamma energy used for identification is less than 250 Kev.

⁸⁹Sr and ⁹⁰Sr Determinations.

Gross Beta where samples are counted on the same date using the same reference nuclide.